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AMERICAN SOCIETY OF CIVIL ENGINEERS

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PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS OF THE SOCIETY

Wednesday, October 15th, 1913.—For the minutes of the regular meeting of October 15th, 1913, which was held in New Orleans, La., see page 700.

Wednesday, October 15th, 1913.—An informal meeting was held at the Society House; Robert Ridgway, Director, Am. Soc. C. E., in the chair; and present, also, 194 members and 24 guests.

George A. Harwood, M. Am. Soc. C. E., Chief Engineer, Electric Zone Improvements, New York Central and Hudson River Railroad, presented a lantern slide description of the Grand Central Terminal work in New York City.

A vote of thanks to Mr. Harwood, proposed by Alfred Noble, Past-President, Am. Soc. C. E., was carried unanimously.

Adjourned.

November 5th, 1913.—The meeting was called to order at 8.30 P. M.; Vice-President J. Waldo Smith in the chair; T. J. McMinn, Assistant Secretary, acting as Secretary; and present, also, 193 members and 20 guests.

The minutes of the meetings of September 17th and October 1st, 1913, were approved as printed in *Proceedings* for October, 1913.

A paper entitled "Concrete Bridges: Some Important Features in Their Design", by Walter M. Smith, Sr., M. Am. Soc. C. E., and Walter M. Smith, Jr., Jun. Am. Soc. C. E., was presented by Mr. Walter M. Smith, Sr., and the subject was discussed by Messrs. C. E. Gregory, H. H. Quimby, A. C. Janni, Wilson F. Smith, and the author. The Assistant Secretary read a communication on the subject from S. W. Bowen, M. Am. Soc. C. E.

A paper by J. L. Van Ornum, M. Am. Soc. C. E., entitled "The Effect of Saturation on the Strength of Concrete", was presented by title, and communications on the subject from Messrs. E. A. Moritz, J. R. Worcester, Walter S. Wheeler, and Clifford Richardson, were read by the Assistant Secretary. The paper was discussed orally by H. H. Quimby, M. Am. Soc. C. E.

The Assistant Secretary announced the following deaths:

ERNEST PONTZEN, of Paris, France, elected Corresponding Member, January 5th, 1876; died October 13th, 1913.

LUTHER REESE ZOLLINGER, of Philadelphia, Pa., elected Member, March 6th, 1901; died October 21st, 1913.

HORACE GUY MERRICK, of La Crosse, Wis., elected Associate Member, May 7th, 1913; died October 30th, 1913.

Adjourned.

NEW ORLEANS MEETING.

October 15th, 1913.—The meeting was called to order at 8.15 P. M., in the Grunewald Hotel, New Orleans, La.; Vice-President J. Waldo Smith in the chair; Chas. Warren Hunt, Secretary; and present, also, about 150 members and guests.

Weston E. Fuller, M. Am. Soc. C. E., presented his paper entitled "Flood Flows," illustrating it by numerous stereopticon slides.

President Swain took the chair.

The Secretary read a discussion by Arthur E. Morgan, M. Am. Soc. C. E., and announced that he also had written communications on the subject from Messrs. E. Kuichling, Herbert E. Bellamy, E. F. Chandler, H. V. Hinckley, and Allen Hazen.

Messrs. Morris Knowles and Arthur E. Morgan discussed the paper orally. The other written discussions were not presented on account of lack of time.

George G. Earl, M. Am. Soc. C. E., delivered a very interesting talk on the Sewerage, Drainage, and Water-Works of New Orleans, which was illustrated by stereopticon slides.

The Secretary announced that the following members of the Society had been appointed by the Board of Direction as a Special Committee to draft A National Water Law: F. H. Newell, George G. Anderson, Charles W. Comstock, Clemens Herschel, W. C. Hoad, Robert E. Horton, John H. Lewis, Charles D. Marx, and Gardner S. Williams.

The Secretary also announced that the Board of Direction has appointed a Special Committee to Study the Question of Floods, Flood Prevention, and other allied subjects; that the Committee is not quite complete, and therefore that the names of the members cannot be announced at present.

Adjourned.

REPORT IN FULL OF FIRST SESSION, NEW ORLEANS MEETING

October 15th, 1913.—The meeting was called to order in the Gold Room of the Grunewald Hotel, New Orleans, La., at 10:30 A. M., by F. M. Kerr, M. Am. Soc. C. E., Chairman of the Local Committee of Arrangements.

There were present about 150 members and guests.

MR. KERR.—Ladies and gentlemen, and members of the American Society of Civil Engineers and of the Louisiana Engineering Society: As Chairman of the Local Committee of Arrangements, it is my very pleasant duty to announce the opening of this meeting of the American Society of Civil Engineers, and without further preamble, we will proceed to carry out the programme.

The first item on the programme should have been an address of welcome by His Excellency, Luther E. Hall, Governor of the State of Louisiana, but to our great regret, the Governor was called out of the city on extremely urgent business matters, of great importance to the State, and is, therefore, unable to be with us this morning. I am sure that he regrets it as much as we do.

The next in order in our great State, is our beloved Crescent City, and I know of no one who can better, more sincerely, more fully, and more quickly make all feel entirely at home with us than our popular Mayor, the Honorable Martin Behrman, whom I now have the pleasure of introducing to you.

MAYOR BEHRMAN.—Mr. Chairman, ladies and gentlemen, members of the American Society of Civil Engineers: It is unnecessary for me to tell you what distinguished pleasure it gives me this morning to welcome to our city the members of the American Society of Civil Engineers and their families. I always knew that a man, to be a Civil Engineer, naturally, of course, must be educated; he must be a level-headed man, and this is evidenced more especially to-day by the fact that so many of the members have brought their wives with them,

because I know from experience that, no matter how carefully we may draw our plans, the head of the household must sometimes be allowed a little liberty. So, I say to the engineers, so many of whom have brought their wives, that whatever plans have been made for their entertainment, I know will include and have the full approval of their entire families.

It is with peculiar delight that I welcome you here to-day, for the reason that we owe so much in this section to the brains of the members of your Profession and Society. We have a great number of the members of your Society here who have done a great deal to put this city in its present position. Our systems of sewerage and drainage and our levee system are all due to the intellects of the members of your organization. I am glad that you all are going to have an opportunity to see the results of some of the work of these engineers.

You will, of course, have an opportunity to inspect our magnificent harbor. You will see the long lines of great docks covered with steel sheds. You will see a practical belt railroad in operation. You will see our splendid filtration plant, clarifying the waters of the Mississippi River, which at one time was thought impossible. You will see our magnificent school buildings. You will see the wonderful docks at Port Chalmette, and the new roads and highways of the City of New Orleans. In fact, you will see so many things that will be of interest to the members of your Profession, that you will all be glad that you have come to New Orleans.

When I stand before you as the representative of this municipality, uttering these words of welcome, I know that the city has a well-earned and well-merited reputation to sustain for its hospitality, but in the use of the mere formal word of welcome, it does not mean the cold, chilly word "welcome" alone; when we say that we give to you the keys of our city it does not mean a superficial key presented to you; it means that it opens the hearts and homes of all our people to the stranger who comes this way.

In this city you will find much of interest to you, both of history and of tradition. The great wide street below this hotel practically divides the old from the new. Below Canal Street you will find scenes which remind you of Madrid and Paris, and above Canal Street you will see the live, hustling, bustling American city.

On Canal Street—I say this for the particular benefit of the ladies—you will find the most magnificent shopping district in this country.

Now, I know you have not come here to listen to a speech from me, but I want to say to you that I am proud of our city, and I want you to leave here, feeling pride in the things that have been done by the members of your Profession. You know that a great many people say we are too modest down here. I told the grain dealers yesterday

that a man who has been a candidate for public position several times cannot be accused of being very modest, because he has to get out and hustle, and ask people to vote for him, and that, you know, has a great tendency to remove any traces of modesty.

Of course, I know that you gentlemen of the Engineering Societies will not look at the many important works which have been carried on here, and which mean so much to this section of the country, from the business point of view, but you will look at them from the engineering standpoint, and see the wonderful results which have been accomplished by the engineers. You will learn that we have two sets of sewer systems, one for sanitary purposes and the other for taking care of the drainage of the city, and I know that the necessity for these will be explained to you by some of the members of your Society.

Again, I wish to say that it is my great pleasure and delight, this morning, on behalf of all the people of this city, to bid you a most hearty welcome.

MR. KERR.—Associated with the members of the American Society of Civil Engineers, is the Louisiana Engineering Society, and in our endeavors to welcome and entertain you as our guests, we have with us on the platform to-day the President of that Society, who will speak on its behalf. I have the pleasure of introducing Mr. Shaw, President of the Louisiana Engineering Society.

A. M. SHAW, M. AM. SOC. C. E.—Ladies and gentlemen and fellow-members: After those kind words of introduction from Mr. Kerr, I hardly have the face to start my remarks as I had intended, but must ask some kind and disinterested person to make a careful record of the time consumed by me, and compare it with the gentlemen who follow me, because the only source of friction at the many pleasant meetings which the Local Committee has had in preparing for this affair has been the insistent demand, that has been made and continuously impressed on me, that I should make my remarks brief, boil them down, make them short, and shorter, and I want a careful comparison made.

You have been welcomed to our city by his Honor, the Mayor, and it is now in order that you should be greeted by the local engineering society, as we are comparatively strangers, and among those present it might be well for some one to start introducing one another.

As for the Louisiana Engineering Society, I want to say that it was organized in 1898, and during its fifteen years of life, has experienced the usual ups and downs of an organization of that nature. It now has about 190 members, divided into grades corresponding approximately to those of the American Society of Civil Engineers; we also have resident and non-resident members, associates, and juniors, and a student membership, to which are eligible the members

of the senior classes in engineering in our Tulane University of New Orleans, and the State University at Baton Rouge.

The Louisiana Society numbers among its members, and especially among its past-presidents, engineers who have made their marks in the Profession. Now, I am going to take occasion to explain a predicament in which we find ourselves. We have an article in our Constitution which provides that no President may succeed himself in office, and this article the members of the Association have distorted into the view that no Past-President is eligible for re-election. The result is that we have exhausted all the available, or suitable, presidential timber, and, as the mill men down here say, when they have cut off all their long-leaf yellow pine, the mill is now working in loblolly, and that will explain how I came to be President.

We claim much credit for work that has been done by the Society in the past, and by various members of the Society in the past few years, for the betterment of conditions surrounding the Profession. Perhaps the most notable work was securing the enactment of a law regulating the practice of Civil Engineering by the State of Louisiana, the local society of engineers being largely responsible for it. A great deal has been said and written in adverse criticism of this law, many of the regulations of which are claimed to be irksome, but our only reply is that here in Louisiana it has been a success—not an unqaulified success—no one expected that, but a sufficiently pronounced success fully to justify its existence. Perhaps the greatest benefits which have been derived are not so much the fear of punishment for violations of the law, but that the general conditions of the engineeers themselves have been bettered; and I well remember the discussion that occurred at the time the law was being considered, and now see the betterment that has resulted from its operation. In these discussions, it has been evident to every one that there is a necessity for this among the better engineers, and this has established a code of ethics, not well-defined and uniform, but one that has tended to a better understanding among the members of the Profession.

In bringing this about, the Louisiana Engineering Society and its members deserve considerable credit for the work done along those lines; and, that being the case, I present to you a body of men who are with the members of the American Society of Civil Engineers in their efforts to raise the standards of the Profession and increase the esteem in which it is held by the public at large. I have pleasure in presenting to you the Louisiana Engineering Society.

Mr. Kerr.—The next item on our programme—I do not wish to inflict on you any remarks from the Chairman of the Local Committee of Arrangements, because I feel that everything that could be said, has been included in the remarks of Mr. Shaw—but we have with us one of the most prominent members of the Engineering Profession, and

I have pleasure in introducing to you a gentleman who is well known to almost all of you, Mr. Swain, President of the American Society of Civil Engineers.

GEORGE F. SWAIN, PRESIDENT, AM. SOC. C. E.—Your Honor, Mr. President of the Louisiana Engineering Society, Mr. Chairman of the Committee of Arrangements: On behalf of the American Society of Civil Engineers, which I have the honor to represent on this occasion, I tender you our most hearty thanks for your kind words of welcome. We are very glad indeed to be here, and we are glad that you are glad to see us. According to my experience, there is scarcely anything that is more instructive than travel. Not only does one meet new people, but the fact that he keeps his eyes open and observes what he really sees, necessarily gives him a broader point of view, makes him more modest, and less self-satisfied. After we have been accustomed at home for years to doing our work in our own way, until we finally come to think that is necessarily the best way, and that no improvements can be made, if we then go into another part of the country, and see other people doing that same work in perhaps a better way, or, at all events, in a different way, along lines that seem to be an improvement on our own method, and see them solving problems very different from those we have to face, and which we have never thought of, we must necessarily gain a great deal of information from the different points of view, and come to feel a little bit more modest, and, as I said, a little less self-satisfied. We must have a little more regard and appreciation for other people.

We have come here to this meeting, as I understand it, from distant parts of the country. Some of us from New England, with its rocky soil, where the principal crop is the ice crop, some of us from the far West with its boundless wheat fields, and the rest of us from the Southern portions of the country. We have come to this beautiful sunny southern land, with its rice fields, its plantations of sugar cane, its balmy breezes and all the other different conditions—the differences between this land and ours—and I think that we will all give more thought to these things, and to the realization of the great diversity of this great land of ours, the great diversity in its products, and we will be made to realize that this great country offers resources sufficient for almost every need of the people who inhabit it; sufficient not only for almost every need, but almost every luxury, and it must make us feel, therefore, that if we do not permanently remain a prosperous, contented, and happy people, it is not for any lack of physical resources with which it is endowed by the Creator, but it must be because we do not use those resources wisely, or because we perhaps do not take the proper point of view with reference to the duties of one man to another.

Then, there are other advantages in going from one part of the country to another, because of the opportunities afforded to learn to know the people in other sections. This diversity between the different parts of the land means some diversity in the physical characteristics, and diversities in the people, and I am sure that, for my part, I know nothing more beneficial than to travel to distant parts of the country, and to learn to know the people there. I wish we had more travel in our own country, and if I had my way, I would do something to see that every American should see his own country—the North, the South, the East, and the West—before going to foreign lands. Of course, we all realize that in every part of our country there are different points of view, different problems, and different necessities, and especially in forming our opinions on the various matters which we are asked to form an opinion on, we must do that justly.

We engineers represent a class of people who are concerned in dealing with the natural resources, making them available to man, but, in doing this work, two of the strongest aids to the engineer are the financier and the promoter. That combination is requisite for developing and making available the natural resources. When we come here from other parts of the country, we find that you in Louisiana have very different problems confronting you from those we have in the North. You have to control the great "Father of Waters", you have your problems of sewerage and drainage which are so much to you, and we shall study with great interest those problems presented to you here. I am sure that we shall go back to our own difficulties better able to solve the problems that we shall have, from a study of the means by which you have overcome the problems facing you.

I understand that you have great resources, great agricultural resources, and in addition to that, you have an untold supply of gas, great deposits of oil, salt, and sulphur, and probably other natural resources that I know nothing about. We shall pay much attention, and study as carefully as our limited time allows us what you have done in developing those resources.

I cannot forbear, in connection with this visit of the American Society of Civil Engineers to the South, from saying that it is of great personal interest to me, because my first engineering work was done in the South, in connection with the study of one of its great resources, not so great a resource in this State as in some of the other States, but still, a great resource in the South, and that is, its water power.

At that time, a great many years ago, as a young man, I came to know the South and to know the Southern people, and I came to love them—and I want to say that no one can know them without

loving them—and, therefore, this visit is, as I have said, of peculiar interest to me; ever since those days I have embraced every opportunity which presented itself to come to see them.

Now, your Honor, and the gentlemen who represent the Louisiana Engineering Society, again I thank you for your cordial words of welcome, and for the offer of the hospitality of this city—that well-known Southern hospitality—and I feel safe in saying that you could not have any more appreciative guests than we shall be.

Again, I thank you.

MR. KERR.—We have not with us to-day the first lady of the land, the wife of the President of the United States, but we have with us the first lady of the American Society of Civil Engineers, the wife of the esteemed President of that Society, and on behalf of the Louisiana Engineering Society, I take great pleasure in presenting to her this bunch of goldenrod.

MRS. SWAIN.—Members of the Louisiana Engineering Society: I thank you.

MR. KERR.—If you all will pardon me, this comes a little late, but I have just received this telegram from his Excellency, Governor Hall:

"I regret very much my inability to attend the Convention of the American Society of Civil Engineers. I have asked Mr. Alexander to represent me."

I have also a letter that I think will please the members of the Society, from a very charming lady, Mrs. B. M. Harrod, the widow of Major B. M. Harrod, a former President of the American Society of Civil Engineers, which she asks me to read.

"1734 West Beach, Biloxi, Miss.,
"October, 1913.

"MRS. B. M. HARROD sends greetings of love to The American Society of Civil Engineers, and regrets that absence from home will prevent her meeting them in person.

"I have not forgotten that you crowned me your Queen in Quebec. It was ever a source of joy and pride to both the Major and myself.

"May God bless, and prosper you in all your undertakings.

"Very truly yours,
"MRS. B. M. HARROD."

MR. KERR.—Another announcement which I wish to make before we get to other parts of the programme is that to the members of the American Society of Civil Engineers are extended the courtesies of the Young Men's Gymnastic Club, the Chess, Checkers, and Whist Club, and the Southern Yacht Club, to which you all will be admitted on presentation of your badges.

I also have an invitation from the Tulane University of Louisiana at New Orleans, on behalf of the Board of Administrators and Faculty.

Next on the programme is an address by John F. Coleman, M. Am. Soc. C. E., one of our prominent engineers, who will describe the local topographical peculiarities in New Orleans.

Mr. Coleman then addressed the meeting.

MR. KERR.—It now gives me great pleasure, and I know it will be yours, to introduce Arsène Perrilliat, M. Am. Soc. C. E., who will tell you something about Mississippi River control.

Mr. Perrilliat then addressed the meeting.

MR. KERR.—I now have pleasure in introducing to you Mr. Alexander. President of the Conservation Commission of the State of Louisiana, who will represent the Governor and say something to you in his name.

MR. ALEXANDER.—Mr. Chairman, ladies and gentlemen, and members of the American Society of Civil Engineers: I first wish to apologize for my apparent neglect in not being here sooner, and wish to state that only a few moments ago I received the Governor's telegram requesting that I appear before you and express his regrets.

I want to say to you on behalf of the Governor that he is deeply interested in the engineering problems that affect the State of Louisiana, and he is deeply appreciative that this meeting is being held in the principal city in the State of Louisiana, and on his behalf I wish you all a very cordial and hearty welcome, and with the whole people of the State of Louisiana, I sincerely trust that your stay in our midst will be both profitable and pleasant.

It would be probably not inappropriate if I should say to you briefly something of the resources of Louisiana. I should feel particularly inclined to do that, as President of the Conservation Commission of the State of Louisiana, the Commission which has charge of all the State's natural resources, and I am always glad to exploit them, and to tell those who come into our midst, whenever I have an opportunity, something of the wonderful riches of the State of Louisiana.

These resources in themselves have brought up some great problems in engineering, problems in which I am sure you will all be interested. For instance, take the great sulphur mines of Calcasieu Parish, the greatest sulphur deposit in all the world, where the sulphur is being mined from the earth 99.9% pure, and where there is now something like $12 000 000 worth of sulphur pumped out of the ground lying in bins on top of the earth ready for marketing. That mine has presented one of the greatest problems in engineering, and before the people who now operate it took hold of it, many firms had "gone broke" in attempting to solve it. I understand that the mine was originally owned by some people in France, who attempted to reach the sulphur deposit by sinking shafts, but owing to the shifting nature of the soil, quicksands, etc., they were unable to do so, and

finally a plan was invented of pumping hot water down into the bowels of the earth, melting the sulphur, which was brought up in liquid form, run into bins, where it solidified, and became great mountains of sulphur.

In the northern part of the State, we have those wonderful oil fields of Caddo Parish, probably the greatest oil fields in the United States, if not in the world, which are yielding something like one million barrels of oil per month—oil of the very finest grade. These oil fields have also provided some great engineering problems. Recently, a well was brought in which yielded something like twenty-five thousand barrels of oil per day; that well caught fire, and it was a great feat of engineering to put it out. It ran wild for something like fifteen or twenty days, and cost the owners something like twenty-five thousand dollars per day in addition to the expense of extinguishing the fire. I believe that the only process that was found practicable was to assemble about fifty steam boilers around the well and simply drown it with steam. In this way it was finally brought under control.

Another of the great resources of Louisiana is the great natural gas fields, also in Caddo Parish, and producing now, for commercial and domestic purposes, something like two hundred million cubic feet of gas per day. There was a well in that field which had run wild and had been burning for 6 years; this well was a blazing, raging torrent of gas and water, and had formed an immense crater around it. It was considered so great a problem in this country that Government experts who had visited and inspected it, commented on it, and it was held to be a great disgrace that the State of Louisiana should permit this enormous waste. It was estimated that the well was wasting, or exhausting, something like forty or fifty million cubic feet of gas per day, and that before the final closing something like two hundred million cubic feet of gas had gone to waste. The Conservation Commission of Louisiana, through its Engineering Department, took hold of this proposition, and, with the co-operation of the owners, went to work to stop it. It had been estimated that the cost of closing the well would be anywhere from twenty-five thousand to one hundred and fifty thousand dollars. As I said, when we took hold of the problem, there was an immense crater surrounding the well, and by boring it, we discovered where the trouble existed, and found that nothing could be done looking to filling the crater and thus stopping the flow of gas. Then the engineers evolved the idea of putting down a relief well, seventy-five feet away; this well was sunk down to the stratum from which the gas was coming in the original well. After reaching that stratum and making their investigation, the engineers decided that the only thing to do was to pump water down into it, and finally force an entrance between the two wells.

After pumping something like four or five million gallons of water into the relief well, they finally drowned out the wild well, and the entire expense of the solution of this problem was something less than six thousand dollars.

There are many other problems from an engineering standpoint in which we are all interested. We have the wonderful salt deposits of Iberia Parish, which I understand you are to visit. This is probably the greatest salt deposit on the Western Hemisphere. It exists in a salt marsh in the southern portion of Iberia Parish, on the Gulf Coast, and the salt which comes from it is 99.8% pure.

And then we have the wonderful waterways of Louisiana. Of course, the problem of the Mississippi River, which has been briefly explained to you, I understand, by Mr. Perrilliat, is probably one of the greatest confronting the Engineering Profession to-day, and I need not touch upon it.

The reclamation problem, of draining our wet lands and bringing them into cultivation, is another of the vast problems confronting us, and I am glad to say that this is being solved by men of your profession, and thousands of acres of the very richest land on earth are annually being brought into cultivation. These lands are capable of growing anything that grows.

Off our southern coast, we have another great resource, the great game preserve. It is near Avery's Island, which contains the salt mines you are to visit. This is the greatest game preserve in the world, protected under the laws of the State of Louisiana, and comprises something like one hundred thousand acres, set aside as a resting and breathing place for wild fowl of all kinds.

Another of our great resources is the immense oyster beds, probably the greatest in size in the United States, with something like four hundred thousand acres available for the propagation of the finest oysters in the country; and these oysters are going to continue to grow and develop the value of these lands very much in the future, for the State of Louisiana. These are only a few of the many advantages we have. We have the most delightful climate in the world, cool and pleasant in the summer, warm and delightful in the winter; there is hardly a month in which you cannot grow something in these wonderfully fertile lands of ours; of these and the many advantages to be gained by those who come to make their homes among us, we want you to know.

On behalf of the Governor of the State, I bid you a very cordial welcome to the State of Louisiana.

MR. KERR.—Gentlemen, I have here a resolution which I have been asked by J. A. Ockerson, Past-President, Am. Soc. C. E., to present in his behalf:

"RESOLVED: That we extend our most cordial greetings to Mrs. Harrod, and express our deep appreciation of her graceful recognition of our presence in this, her home city."

The resolution was seconded and carried unanimously.

A MEMBER.—I move that a telegram be transmitted to Mrs. Harrod conveying this resolution.

This motion was duly seconded and adopted.

Adjourned.

EXCURSIONS AND ENTERTAINMENTS
NEW ORLEANS MEETING

The arrangements for the Excursions and Entertainments were in the hands of the following Committee:

FRANK M. KERR, *Chairman*,
J. F. COLEMAN, ARSÈNE PERRILLIAT,
E. L. JAHNCKE, A. M. SHAW,
SIDNEY F. LEWIS, W. H. WILLIAMS,
A. M. N. BLAMPHIN.

Wednesday, October 15th, 1913, 2 P. M.—All those in attendance were taken by automobile on a long trip through the city, which occupied the whole afternoon.

Thursday, October 16th.—The members and their guests were taken on a trip in New Orleans Harbor in the Steamer *St. James.* This boat, a typical Mississippi steamer, with a large party on board, left the landing near the head of Canal Street at 10 A. M. and steamed to all parts of the harbor. Lunch was served on board. At the head of Carrollton Avenue the party landed, and in automobiles visited and inspected the Water Filtration plant, Drainage Pumping Stations, and other engineering works, returning to the hotel at 5.30 P. M.

8 P. M.—There was a large attendance at a "Smoker" given in the Hotel Grunewald.

Friday, October 17th.—At 11 A. M. the party, in small groups, for which guides were provided, visited the old French quarter of the city.

2.30 P. M.—In the afternoon a Garden Party at the grounds of the Country Club was attended by a large number of members and guests.

8.30 P. M.—A Dinner Dance was given in the evening in the roof garden of the Hotel Grunewald.

Saturday, October 18th.—The day was devoted to an excusion to Avery Island and the Salt Mines near New Iberia, and was enjoyed by a large number of members and guests. At 8. A. M. the party was conveyed in special cars of the New Orleans Railway and Light Company, to the Southern Pacific Ferry at the head of Esplanade Avenue, and crossed the river to Algiers. There, by the courtesy of the

Southern Pacific Railroad, Mr. Guy Hopkins, General Superintendent, a special train was provided. Through the courtesy of General Dudley Avery, of the Avery Rock Salt Mining Company, and Messrs. E. A. McIlhenny, E. A. Hill, and Sidney Crawford, connected therewith, every facility was afforded for a complete inspection of the salt mines. Luncheon was served. The return to New Orleans was somewhat delayed, the party arriving there about 11.30 P. M.

9.45 P. M.—A number of members took advantage of the opportunity to visit the Panama Canal, sailing for the Isthmus on one of the United Fruit Company's steamers.

Attendance

At this meeting of the Society, the first held outside of New York City, 478 persons were present, of which 121 were connected with the Society, 86 were members of the Louisiana Engineering Society, and 271 were guests.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

December 3d, 1913.—8.30 P. M.—A regular business meeting will be held, and two papers will be presented for discussion, as follows: "Coal Piers on the Atlantic Seaboard," by J. E. Greiner, M. Am. Soc. C. E., and "Topographical Surveys Made by the American Section of the International Boundary Commission, United States and Mexico," by W. W. Follett, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for October, 1913.

December 17th, 1913.—8.30 P. M.—At this meeting two papers will be presented for discussion, as follows: "Storage to be Provided in Impounding Reservoirs for Municipal Water Supply", by Allen Hazen, M. Am. Soc. C. E.; and "The Depreciation of Public Utility Properties as Affecting Their Valuation and Fair Return," by John W. Alvord, M. Am. Soc. C. E.

These papers are printed in this number of *Proceedings.*

January 7th, 1914.—8.30 P. M.—This will be a regular business meeting. A paper by A. H. Sabin, Assoc. M. Am. Soc. C. E., entitled "Painting Structural Steel: The Present Situation," will be presented for discussion.

This paper is printed in this number of *Proceedings.*

ANNUAL MEETING

The Sixty-first Annual Meeting will be held at the Society House, on Wednesday and Thursday, January 21st and 22d, 1914. The arrangements for the Annual Meeting have been placed in the hands of the following committee: Messrs. Robert Ridgway, Henry W. Hodge, and Chas. Warren Hunt. The Business Meeting will be called to order at 10 o'clock on Wednesday morning. The Annual Reports will be presented, officers for the ensuing year elected, members of the Nominating Committee appointed, Reports of Special Committees presented for discussion, and other business transacted.

SPECIAL MEETINGS FOR TOPICAL DISCUSSION

On the two days immediately following the Annual Meeting, three meetings of the Society will be held, at which the subject for discussion will be "Road Construction and Maintenance."

The meetings will be held as follows:

First Meeting, Friday, January 23d, 1914.—10 A. M.—The following sub-division of the subject will be discussed:

(1) "Engineering Organizations for Highway Work."

Second Meeting, Friday, January 23d, 1914.—2 P. M.—The following sub-division of the subject will be discussed:

(2) "Factors Limiting the Selection of Materials and of Methods in Highway Construction."

Third Meeting, Saturday, January 24th, 1914.—10 A. M.—The following sub-division of the subject will be discussed:

(3) "Equipment and Methods for Maintaining Bituminous Surfaces and Bituminous Pavements."

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

Proceedings, and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

(Abstract of Minutes of Meetings)

August 15th, 1913.—The meeting was called to order; Vice-President C. H. Snyder in the chair; E. T. Thurston, Jr., Secretary; and present, also, 46 members and guests.

Messrs. M. C. Couchot, V. H. Poss, and L. H. Nishkian, of the Committee on the Building Ordinance of San Francisco and Its Enforcement, presented certain conclusions arrived at by that Committee.

The subject was discussed by Messrs. A. L. Bobbs, J. B. Leonard, R. S. Chew, C. E. Grunsky, H. D. Dewell, C. H. Snyder, L. E. Hunt, A. Judell, and E. T. Thurston, and, on motion, the Committee was directed to make a careful, detailed study of the engineering sections of the Ordinance and report its recommendations at the October meeting.

Adjourned.

October 17th, 1913.—The meeting was called to order; President Wing in the chair; E. T. Thurston, Jr., Secretary; and present, also, 57 members and guests.

A list of suggestions for increasing the scope and usefulness of the Engineering Library of the Mechanics' Institute, submitted as having had the approval of the Pacific Association of Consulting Engineers, was endorsed by the meeting, and the Secretary was instructed to transmit copies of the same to the local societies of mining, mechanical, and electrical engineers.

At the completion of the business meeting, the members arose and remained standing out of respect to the memory of the late Arthur L. Adams, M. Am. Soc. C. E., a Past-President of the Association and one of its founders, while President Wing made a few appropriate remarks.

After a protracted discussion as to how far and in what manner the Association might proceed in making suggestions as to the Amendment of the Building Ordinance of San Francisco, the conclusion was reached that, though the Association might not act officially on any proposed amendments, discussion of the subject might be undertaken, and that thereafter any member or group of members, individually or collectively, might publish the conclusions arrived at for the benefit of the public.

Messrs. M. C. Couchot and L. H. Nishkian, of the Association's Committee on the Building Ordinance, presented the Committee's suggestions to the meeting, and these were discussed in detail by Messrs. H. J. Brunnier, H. D. Dewell, R. S. Chew, Charles Derleth, Jr., C. W. Wing, W. L. Huber, A. V. Saph, and W. J. Miller.

Adjourned.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, Jun. Am. Soc. C. E., 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meeting)

October 11th, 1913.—The meeting was called to order; Vice-President E. F. Vincent in the chair; Roger W. Toll, Secretary; and present, also, 10 members and 5 guests.

The minutes of the meeting of September 13th, 1913, were read and approved.

A paper by Leonard Lundgren, Assoc. M. Am. Soc. C. E., on the "Organization and Conservation Policy of the United States Forest

Service," was presented by the author, and the subject was generally discussed by others present.

Leonard Metcalf, M. Am. Soc. C. E., addressed the meeting in regard to the recent activities and matters now under discussion by the American Society of Civil Engineers.

Adjourned.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and B. M. Hall, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

Philadelphia Association

At its meeting of June 4th, 1913, the Board of Direction of the Society considered and approved the proposed Constitution of the Philadelphia Association of Members of the American Society of Civil Engineers.

Portland, Ore., Association

On June 18th, 1913, the Portland, Ore., Association of Members of the American Society of Civil Engineers was organized with the following officers: E. G. Hopson, President; W. S. Turner, First Vice-President; D. D. Clarke, Second Vice-President; G. B. Hegardt, Treasurer; and Charles J. McGonigle, Secretary.

Seattle Association

On June 30th, 1913, the Seattle Association of Members of the American Society of Civil Engineers was organized with the following officers: Samuel H. Hedges, President; Ernest B. Hussey, Vice-President; and Joseph Jacobs, Secretary-Treasurer.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philade.phia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 415 Washington Avenue, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From October 2d to November 3d, 1913)

DONATIONS*

DESIGN OF PLATE GIRDERS.

By Lewis E. Moore, Assoc. M. Am. Soc. C. E. Cloth, 9½ x 6¼ in., illus., 8 + 285 pp. New York and London, McGraw-Hill Book Company, Inc., 1913. $3.00.

This volume, it is stated, is the outcome of the author's practical experience in bridge design and construction and as a teacher of the subject at the Massachusetts Institute of Technology. In his work, he has found, the preface states, that students as a rule have few ideas about designing and designs, and his aim in this book has been to explain clearly and in detail the reasons underlying a design, to show the assumptions made in given cases, and to give, as far as possible, alternative methods; in fact, to develop the ability of the student in order that he may be able to make an intelligent choice among various methods. The first two chapters, on stresses and riveting, have been made purposely short, it is stated, the treatment of the latter subject, however, differing somewhat from that usually given. The theory of plate girder design has been discussed in detail, it is further stated, and detailed designs of two different plate girders have been worked out with careful discussion of each point as it arises, railroad bridges being used. The principles developed in these designs, the author states, are of general application and can easily be extended to architectural work. The specifications of the New York, New Haven and Hartford Railroad have been used as a basis in these designs and are discussed in detail. Box girders are similarly worked out, it is stated, using a fixed load and without any specifications, the material on deflections, which is by Professor W. H. Lawrence, of the Massachusetts Institute of Technology, never before having appeared for general distribution. The chapter on Shop Hints is by John C. Moses, M. Am. Soc. C. E., and has been incorporated, it is said, to give the student ideas as to cost and shop possibilities. Tables are also included which the author hopes will be of aid to the practicing engineer in the design of plate girders by approximate and exact methods. The Contents are: Stresses in Plate Girders; Rivets; Theory of Plate Girders; Design of Through Plate Girder; Deck Plate Girder Design; Box Girders; Shop Hints for Structural Draftsmen; General Specifications for Steel Railroad Bridges; Conventional Signs; Tables; Index; Index to Specifications; Index to Tables.

THE ARCHITECTS' DIRECTORY AND SPECIFICATION INDEX FOR 1913-14

Containing a Complete List of the Architects of the United States and Insular Possessions, Canada, Cuba, and Mexico; Classified by States and Towns; Landscape and Naval Architects of the United States and Canada, etc.; A Specification Index of Prominent Dealers and Manufacturers of Building Materials and Appliances. Tenth Edition. Cloth, 10¼ x 7 in., 204 pp. New York, The William T. Comstock Company, 1913. $3.00.

In addition to the above information other important material is included in this book, namely, alphabetical lists of periodicals devoted to the interests of architecture and building, with names of publishers and subscription prices; architectural schools in the United States; architectural societies and organizations of the world, with names and addresses of their officers; and names and addresses of architects of Boards of Education, and of the Building Departments, in the principal cities of the United States and Canada. The professional codes adopted by the American Institute of Architects and the Province of Quebec Association of Architects, are also included, and under the Classified List of Architects are given the names and addresses of the officers of the State Boards of Examiners of Architects of the various States. For this, the tenth edition, a careful recompilation of the entire list has been made, the names and addresses, it is stated, having been checked by correspondence, the aim being to obtain an accurate list even at the expense of omitting the names of architects and firms which could not be verified.

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* Unless otherwise specified, books in this list have been donated by the publishers.

THE ROLLING MILL INDUSTRY:

A Condensed General Description of Iron and Steel Rolling Mills and Their Products. By F. H. Kindl. Cloth, 9¼ x 6¼ in., illus., 76 pp. Cleveland, Ohio, The Penton Publishing Company, 1913. $2.00.

This book, the preface states, contains a summary of American rolling mill practice, the development of which is traced from its beginning to the present day. The author has also attempted, it is further stated, to define more closely the various kinds of mills and their products. Charts are given which show graphically the production of semi-finished and finished products and which represent modern practice at some of the largest open-hearth plants and rolling mills. Other charts are included which illustrate the quantities of material charged and produced in making one ton of pig iron; the distribution and production of iron and steel in 1907 and 1911; the conversion of pig iron into the various finished products, etc. A table is also given showing the comparison of the general fundamental factors dictating the production of pig iron in the United States, Germany and Great Britain, with particular reference to the Pittsburgh district of the United States, the Rheinland-Westfalia district of Germany, and the Cleveland district of Great Britain. The Chapter headings are: Historical; Classification of Rolling Mills; Finished Products; The Wire Industry; Tube and Pipe Industry; Tin and Terne Plate Industry; Statistical; Index.

UNDERGROUND WATERS FOR COMMERCIAL PURPOSES.

By Frank L. Rector. Cloth, 7¾ x 5 in., illus., 5 + 98 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1913. $1.00.

The subject of waters for commercial purposes, the author states, has heretofore received little attention, the available published material being devoted to considerations of waters for industrial uses and for municipal and public supplies. It has been his aim, therefore, in this book, to discuss in detail the question of bottled or mineral waters for drinking and domestic uses, their sources, properties, etc., a bibliography of the subject also being included. The Chapter headings are: Introduction; Source of Water; Ground Water; Distribution and Properties of Water; Springs; Wells; Watershed; Mineral Water; Chemical Examination; Bacteriological Examination; Microscopical Examination; Appendix: Useful Rules and Tables; Bibliography; Index.

ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.

By Dugald C. Jackson, M. Am. Soc. C. E., and John Price Jackson. New Edition, Rewritten and Enlarged. Cloth, 9 x 6 in., illus., 9 + 968 pp. New York, The Macmillan Company, 1913. $5.50.

The first edition of this book was published in 1896. The present edition is said to have been entirely rewritten and greatly extended in order to bring the subject-matter up to the requirements of present-day teaching, the aim of the authors being to set forth the best treatment of each of the problems of alternating currents, together with the best literature and practice in connection with the subject. It is hoped that the book will be found valuable as a textbook as it is stated to cover the ground for a fairly complete course in the essential elements of alternating currents and their applications to machinery, as well as instruction in the electrical transmission of power. It is also intended as a reference book in respect to the principles used in the numerous modern applications of alternating currents to practical purposes. The phraseology is simple, it is stated, and follows standard practice. Mathematics have been avoided as far as possible in the text, and numerous examples are given to illustrate methods of utilizing the principles discussed, as well as numerous references to correlated literature. The Contents are: The Voltage Developed by Alternators; Elementary Statements Concerning Transformers and Measuring Instruments; Armature and Field Windings for Alternators; Self-Induction, Electrostatic Capacity, Reactance and Impedance; The Use of Complex Quantities Extended; Solution of Circuits; Power; Polyphase Circuits and the Measurement of Power Therein; Hysteresis and Eddy Current Losses; Mutual Induction; Synchronous Machines; Asynchronous Motors and Generators; Self-Inductance, Mutual Inductance, and Electrostatic Capacity of Parallel Wires; Index.

THE PANAMA GUIDE.

By John O. Collins. Cloth, 9 x 6 in., illus., 326 pp. Quartermaster's Department, Mount Hope, C. Z., I. C. C. Press, 1912. $1.35. (Donated by the Author.)

In the Introduction it is stated that this book contains answers to most of the questions which the author has been asked during the last four years in regard to Panama and the Panama Canal. He includes descriptions of the country and cities, its history, both ancient and modern, its customs, flora, meteorology, etc.; histories and descriptions of the Panama Canal and Panama Railroad; Government regulations as to postage and customs; the various treaties; Acts of Congress in relation to the Panama Canal; a census of the Canal Zone, etc. The Contents are: The Master Builder; From Colon to Panama; The Panama Canal; Panama Railroad; History of Panama; Panama To-Day; City of Panama; Old Panama; Miscellaneous; Index.

STEEL DESIGNING (STRUCTURAL ENGINEERING, BOOK THREE).

By Edward Godfrey, M. Am. Soc. C. E. Leather, 6¾ x 4¼ in., illus., 492 pp. Pittsburgh, The Author, 1913. $2.50.

The keynote of this book, the author states, is sound engineering in every detail of steel design, the book being intended for use by all classes of men who have to do with structural steel. For the student, the principles of correct design in steel work are said to be emphasized and exemplified; for the inspector in mill and shop, the principles of correct manipulation are laid down; for the draftsman, standard and economic and consistent details are defined; for the college instructor, practical methods are set forth; and for the designing and consulting engineer, errors are pointed out. Much emphasis, it is stated, is placed on the importance of details and of simple and rational methods, and also on the waste of material. Errors of design are noted, and numerous examples of designs in various classes of steel construction are also included. The Contents are: The Working of Iron and Steel; The Preservation of Iron and Steel; Some Notes on Structural Detail Drawing; Some Notes on Detail Designing; Notes on Bridge Design; Notes on Building Design; Mill Building Design; The Design of Beams and Girders; Designing of Tension Members; The Strength of Compression Members; Designing of Compression Members; Rivets and Riveted Connections; End Connections of Tension Members; End Connection of Compression Members; Splices; Pins; Loads and Unit Stresses; Estimating Weights; Shear; Camber; Curvature; Grade; Provision for Expansion and Contraction; Tractive Stresses; Notes on Draw Bridges; Tanks; Greenhouses and Skylights; Gears; Inspection and Tests of Steel Work; Some Illustrations of Design in Various Classes of Structures; General Engineering Data; Specifications for Structural Steel Work; Definitions; Index.

THE SCIENCE OF BURNING LIQUID FUEL:

A Practical Book for Practical Men. By William Newton Best. Cloth, 9¼ x 6¼ in., illus., 159 pp. No place, The Author, 1913. $2.00.

In order to obtain the highest possible efficiency and the strictest economy from any installation for burning liquid fuel, the oil system, it is stated, must be installed and operated on sicentific principles. The author states that for the last twenty-five years he has made a study of such principles and has installed oil burners and applied designs for nearly every kind of furnace. In this book he has endeavored to supply his readers with information as to the exact service of boilers, furnaces, oils, etc., from a practical rather than a technical standpoint, by descriptions of the various installations required in an oil-burning system and by discussions of the results obtained with such system. It is further stated that the burners, furnaces and various installations described are fully protected by Letters Patent, and that all are in successful operation. The Contents are: Introduction; Liquid Fuel, Its Origin, Production and Analysis; Atomization; Oil Systems; Refractory Material; Locomotive Equipment; Stationary and Marine Boilers; Ovens; Furnaces; Index.

FREIGHT RATES: STUDIES IN RATE CONSTRUCTION.

By John P. Curran. Cloth, 9¼ x 6¼ in., 5 + 367 pp. Chicago, Railway Text Book Publishing Company, 1913. $5.00. (Donated by the Author.)

It is stated that the aim of the author has been to give, in a clear, concise manner, the bases or structures of freight rates which, he states, are based generally on scientific principles, and, for purposes of instruction only, to illus-

trate such principles. He prefaces his illustrations with a short history of transportation and freight rates. He also gives Sections 1 to 6 of the "Act to Regulate Commerce" passed by Congress in 1887, including the new matter substituted by the Act of June 18th, 1910. This is followed by the examples which include lists of groupings of stations in the various territories and the rates governed by the various Associations, examples of percentage bases, of the "group relation theory" and the basing point system, lake and rail rates, etc., etc.

THE GYROSCOPE.

By F. J. B. Cordeiro. Cloth, 8¼ x 5½ in., illus., 7 + 105 pp. New York, Spon & Chamberlain; London, E. & F. N. Spon, Limited, 1913. $1.50.

The development of the theory of gyroscopics is said to date from the time of Newton; its practical applications, however, are of modern date. In this book, the author offers, it is stated, a monograph on the subject, which may be easily understood by any one possessing an elementary knowledge of mechanics and the calculus. He has divided his subject-matter into two parts, namely, the development of the theory from the fundamental gyroscopic principle, and a discussion of its modern applications, such as the Griffin grinding mill, the Howell and Obry devices for keeping a torpedo in a straight course; the Schlick stabilisator for steadying the motion of ships, the Brennan gyro-monorail, the gyro-compass, etc., etc.

SAFETY:

Methods for Preventing Occupational and Other Accidents and Diseases. By William H. Tolman and Leonard B. Kendall. Cloth, 9 x 6 in., illus., 12 + 422 pp. New York and London, Harper & Brothers, 1913. $3.00.

It is believed, as stated in the Introduction, that men of affairs, business managers, officers, upper employees, students entering on industrial careers, and that portion of the public which is interested in the industrial and social issues of the day, will find that this book, which is said to be the first and only comprehensive work on the subject that has been issued in the English language, is of distinct value. It is a handbook of information for everyone interested in industrial conditions, and shows by typical examples from many sources, such as the prevention work and welfare bureaus of the Pennsylvania Railroad Company, the Midvale Steel Works, the United States Steel Corporation, etc., and various English and German plants, how to surround workers with adequate safeguards to protect them at work, and how to promote the essentials of shop hygiene; in fact, it is said to illustrate the underlying principles of the world movement for safety and industrial hygiene and welfare. The Contents are: Introduction; Part I, General Conditions: The Philosophy of Safety; Neglected Factors; The Working-Place. Part II, Danger Zones: Yards, Walks, Railings and Hoists; Cutting and Grinding Tools; Illumination; Fire; Transportation; Safety Committees; Iron and Steel; Mines and Mining; Electricity; General Aids to Safety; Organized Efforts by Employers. Part III, Industrial Hygiene: Committees on Sanitation; Industrial Poisons; Chemical Industries; Shop Sanitation. Part IV, Social Welfare: Industrial Education; Meeting the Public; Training Future Workers; Something More Than Wages; After Hours; The American Museum of Safety; Index.

ABHANDLUNGEN AUS DEM GEBIETE DER TECHNISCHEN MECHANIK.

Von Otto Mohr. Zweite Neubearbeitete und Erweiterte Auflage. Paper, 9½ x 6¾ in., illus., 12 + 567 pp. Berlin, Wilhelm Ernst & Sohn, 1914. 18 marks.

This book is a compilation, it is stated, of articles on applied mechanics which have appeared in various technical periodicals. The subject-matter embraces, it is said, the main points of elementary mechanics, the primary mathematics, and the elements of differential and integral calculus, and is intended for the use of students in building and mechanics. The text is fully illustrated, and, at the end of each chapter, a short bibliography of the subject discussed in that chapter, is given. Numerous other references to related subjects are also included. In this, the second edition, the text, the preface states, has been revised and numerous additions have been made, including two new chapters, one relating to stresses in dams and

the other to the theory of the simple girder. Chapter II contains new rules, by means of which, the author states, the treatment of the principles of graphic statics has been greatly simplified. In Chapter V, in which the test data relating to the strength of materials as given in the first edition are stated to have been criticized, more complete data are given to prove the author's hypothesis. In Chapter VI, relating to the study of earth pressures, it is stated that Coulomb's theory is shown to be untenable, and that the disputed points relating to earth pressures cannot be decided by tests. The Chapter headings are: Das Gleichgewicht und die unendlich kleinen Bewegungen eines starren Körpers; Die Grundzüge der graphischen Statik; Die Geometrie der Massen; Die Bewegung der ebenen Getriebe; Welche Umstände bedingen die Elastizitätsgrenzen und den Bruch eines Materials? Die Lehre vom Erddruck; Die Spannungen im prismatischen Balken; Die Spannungszustand einer Staumauer; Der kontinuierliche Balken; Die elastische Linie; Der vollwandige Bogenträger mit Kampfergelenken; Das ebene Fachwerk; Allgemeine Theorie der ebenen Träger; Das Raumfachwerk.

THE PANAMA GATEWAY.

By Joseph Bucklin Bishop. Cloth, 9 x 6 in., illus., 16 + 459 pp. New York, Charles Scribner's Sons, 1913. $2.50.

The author, as Secretary of the Isthmian Canal Commission, has had exceptional opportunities to study, in its various aspects, the work of constructing the Panama Canal, and in this book he gives a complete history of the Canal from its inception. He has divided the subject-matter into five parts: In Part I, Historical, 1502-1879, he relates the history of the Isthmus and of the transit routes across it from the time of Columbus to the period of the French Company's failure. In Part II, The French Effort and Failure, 1879-1902, he tells the story of the efforts and failures of the several French companies to construct a canal across the Isthmus. Part III, American Purchase and Control, 1902-1904, contains the history of the American occupation of the Canal Zone, and in Part IV, Period of Construction, 1904-1915, detailed descriptions of the work of organizing the Commissions and of constructing the Canal are given. Part V, The Completed Canal, describes the Canal as completed and ready for commerce. The Appendixes are: A, Canal Commissions; B, Canal Appropriations and Expenditures; C, An Act to Provide for the Opening, Maintenance, etc., of the Canal Zone; D, Equipment at Period of Greatest Activity; and E, Distances in Nautical Miles. There is also an Index of seven pages.

PRESS REFERENCE LIBRARY, VOL. I:

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HENRIQUES, EDWARD JOSEPH. Care, United Fruit Co., Tela, Honduras		Oct. 1, 1913
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KIRKWOOD, HOWARD CAMBERNE. Engr., Manhattan Div., P. R. R., Pennsylvania Station, New York City (Res., 148 Cypress Ave., Flushing, N. Y.).

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MAYO, GEORGE. Box 42, Templeton, Cal.

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NEUHARDT, EDWIN. Iuka, Miss.

PARTRIDGE, JOHN FREDERICK. 2246 California St., San Francisco, Cal.

PECK, JOHN CALVIN. Office of the Div. Commercial Engr., New York Telephone Co. (Res., 416 Hudson Ave.), Albany, N. Y.

PHALAN, JOHN JOSEPH FRANCIS. 611 Church St., Ann Arbor, Mich.

PHILLIPS, JAMES VERNON. Drainage Engr., U. S. Dept. of Agri., Baxley, Ga.

ROSSI, IRVING. Structural Draftsman, Milliken Bros., Inc., 945 Hoe Ave., New York City.

SEARIGHT, GEORGE PETER. Insp., Board of Water Supply, Box 248, Valhalla, N. Y.

JUNIORS (*Continued*)

SMITH, ROBERT MACKINLAY. 4421 Berlin Ave., St. Louis, Mo.

SMYTH, ARTHUR PORTER. Junior Engr., U. S. Reclamation Service, St. Ignatius, Mont.

SPENGLER, JOHN HENRY. Designer, Eng. Dept., C. & O. Ry., First National Bank Bldg., Richmond, Va.

STARKWEATHER, ALFRED KENNETH. Instrumentman with Passaic Val. Sewerage Comm., Y. M. C. A. Bldg., Passaic, N. J.

STOW, FREDERIC STEVENS. Room 406, Union Station, Providence, R. I.

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STROHL, RICHARDS MERLE. Care, L. T. Berthe, Charleston, Mo.

SWINTON, ROY STANLEY. Insp., Ohio River Impvt., U. S. Govt., 601 Winchester St., Ashland, Ky.

TATUM, ROBERT LEE. U. S. Junior Engr., Box 421, Vicksburg, Miss.

THACKWELL, HENRY LAWRENCE. Hydr. Engr., 1703 Hoge Bldg., Seattle, Wash.

THOMAS, FRANKLIN. Associate Prof. of Civ. Eng., Throop Coll. of Technology, Pasadena, Cal.

VAUGHN, ROMNEY LEIGH. Civ. Engr., Standard Am. Dredging Co., San Pedro, Cal.

WERNECKE, CHAUNCY. 3729 Manayunk Ave., Philadelphia, Pa.

WINN, HARRY STRONG. Engr. of Constr., St. Louis Sewer Dept., 8305 South Broadway (Res., 3410[a] Hartford St.), St. Louis, Mo.

WRIGHT, RENE BARBER. 575 Bidwell Ave., Portland, Ore.

YEO, WILLIAM ALBERT. Care, S. P. & S., 11th St. Depot, Portland, Ore.

DEATHS

MERRICK, HORACE GUY. Elected Associate Member, May 7th, 1913; died October 30th, 1913.

PONTZEN, ERNEST. Elected Corresponding Member, January 5th, 1876; died October 13th, 1913.

ZOLLINGER, LUTHER REESE. Elected Member, March 6th, 1901; died October 21st, 1913.

Total Membership of the Society, November 6th, 1913, 7 219.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST.

(October 2d to November 3d, 1913)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal,* Assoc. Eng. Soc., Boston, Mass., 30c.
(2) *Proceedings,* Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal,* Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal,* Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions,* Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly,* Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur,* München, Germany.
(8) *Stevens Institute Indicator,* Hoboken, N. J., 50c.
(9) *Engineering Magazine,* New York City, 25c.
(10) *Cassier's Magazine,* New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News,* New York City, 15c.
(14) *Engineering Record,* New York City, 10c.
(15) *Railway Age Gazette,* New York City, 15c.
(16) *Engineering and Mining Journal,* New York City, 15c.
(17) *Electric Railway Journal,* New York City, 10c.
(18) *Railway and Engineering Review,* Chicago, Ill., 15c.
(19) *Scientific American Supplement,* New York City, 10c.
(20) *Iron Age,* New York City, 20c.
(21) *Railway Engineer,* London, England, 1s. 2d.
(22) *Iron and Coal Trades Review,* London, England, 6d.
(23) *Railway Gazette,* London, England, 6d.
(24) *American Gas Light Journal,* New York City, 10c.
(25) *Railway Age Gazette,* Mechanical Edition, New York City, 20c.
(26) *Electrical Review,* London, England, 4d.
(27) *Electrical World,* New York City, 10c.
(28) *Journal,* New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal,* Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique,* Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux,* Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil,* Paris, France, 1 fr.
(34) *Portefeuille Economiques des Machines,* Paris, France.
(35) *Nouvelles Annales de la Construction,* Paris, France.
(36) *Cornell Civil Engineer,* Ithaca, N. Y.
(37) *Revue de Mécanique,* Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways,* Paris, France.
(39) *Technisches Gemeindeblatt,* Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung,* Berlin, Germany, 60 pfg.
(41) *Elektrotechnische Zeitschrift,* Berlin, Germany.
(42) *Proceedings,* Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées,* Paris, France.
(44) *Journal,* Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Colliery Engineer,* Scranton, Pa., 25c.
(46) *Scientific American,* New York City, 15c.
(47) *Mechanical Engineer,* Manchester, England, 3d.
(48) *Zeitschrift,* Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m.
(49) *Zeitschrift für Bauwesen,* Berlin, Germany.
(50) *Stahl und Eisen,* Düsseldorf, Germany.
(51) *Deutsche Bauzeitung,* Berlin, Germany.
(52) *Rigasche Industrie-Zeitung,* Riga, Russia, 25 kop.
(53) *Zeitschrift,* Oesterreichischer Ingenieur-und Architekten-Vereines, Vienna, Austria, 70h.

(54) *Transactions*, Am. Soc. C. E., New York City, $12.
(55) *Transactions*, Am. Soc. M. E., New York City, $10.
(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.
(57) *Colliery Guardian*, London, England, 5d.
(58) *Proceedings*, Engrs.' Soc. W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
(60) *Municipal Engineering*, Indianapolis, Ind., 25c.
(61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings*, Inst. C. E., London, England.
(64) *Power*, New York City, 5c.
(65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
(66) *Journal of Gas Lighting*, London, England, 6d.
(67) *Cement and Engineering News*, Chicago, Ill., 25c.
(68) *Mining Journal*, London, England, 6d.
(69) *Der Eisenbau*, Leipzig, Germany.
(71) *Journal*, Iron and Steel Inst., London, England.
(71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
(72) *American Machinist*, New York City, 15c.
(73) *Electrician*, London, England, 18c.
(74) *Transactions*, Inst. of Min. and Metal., London, England.
(75) *Proceedings*, Inst. of Mech. Engrs., London, England.
(76) *Brick*, Chicago, Ill., 10c.
(77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
(78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
(79) *Forscherarbeiten*, Vienna, Austria.
(80) *Tonindustrie Zeitung*, Berlin, Germany.
(81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
(82) *Mining and Engineering World*, Chicago, Ill., 10c.
(83) *Gas Age*, New York City, 15c.
(84) *Le Ciment*, Paris, France.
(85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
(86) *Engineering-Contracting*, Chicago, Ill., 10c.
(87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
(88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
(89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., $5.
(90) *Transactions*, Inst. of Naval Archts., London, England.
(91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
(92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
(93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
(94) *The Boiler Maker*, New York City, 10c.
(95) *International Marine Engineering*, New York City, 20c.
(96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
(98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
(99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, $2.
(100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
(101) *Metal Worker*, New York City, 10c.
(102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
(103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
(104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
(105) *Metallurgical and Chemical Engineering*, New York City, 25c.
(106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
(107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
(108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES

Bridges.

Specifications for Metal Railroad Bridges Movable in a Vertical Plane.* B. R. Leffler, M. Am. Soc. C. E. (54) Vol. 76.
Kinetic Effects of Crowds.* C. J. Tilden, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
Maximum Stresses in Bascule Trusses.* W. Watters Pagon, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
Notes on Bridgework.* S. Vilar y Boy, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
The Sewickley Cantilever Bridge Over the Ohio River.* A. W. Buel, M. Am. Soc. C. E. (54) Vol. 76.
Construction Problems, Dumbarton Bridge, Central California Railway.* E. J. Schneider, M. Am. Soc. C. E. (54) Vol. 76.
A Shortened Method in Arch Computation.* H. A. Sewell. (54) Vol. 76.
The Construction of the Masonry for the New Quebec Bridge.* (12) Sept. 26.
Illinois River Bridge, St. L., P. & N. W. Ry. (87) Oct.
Concrete Railroad Bridges of Three Different Types.* A. M. Wolf (87) Oct.

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The Carondelet Park Bridge, St. Louis, Mo.* Charles W. Martin. (13) Oct. 2.
Kaministiquia River Bridge, Fort William.* (96) Oct. 2.
Double Deck Bascule Bridge.* (15) Oct. 3.
Bridges of the Connecticut Company.* (17) Oct. 4.
The Broadway Bridge, over Willamette River, Portland, Ore., with Rall Bascule Span.* W. P. Hardesty. (13) Oct. 9.
Bridges and Culverts for Country Roads. A. R. Hirst. (Paper read before the Am. Road Congress.) (13) Oct. 9; (14) Oct. 4; (96) Oct. 9; (86) Oct. 15.
Designing Concrete Spans for a Railroad Bridge. (14) Oct. 11.
Artistic Masks for Ugly Bridges.* (14) Oct. 11.
Direct-Lift Bridges.* (14) Oct. 11.
New Bulak Bridge at Cairo.* (12) Oct. 17.
Renewing Two Double Track Swing Spans. (15) Oct. 17.
Some Points Relative to the Design and Shipment of Plate Girders.* (86) Oct. 22.
A Description of the Principal Bridge Dams in the United States and in Foreign Countries. H. G. Tyrrell. (86) Oct. 22.
Specifications for Concrete Masonry in Highway Bridges. (96) Oct. 23.
The Design of Concrete Abutments without Wing Walls for Deck Girders.* C. M. Luther. (13) Oct. 23.
Equivalent Uniform Loads on Bridges for Different Types of Engine.* (13) Oct. 23.
New Bridge over the Rhine at Cologne.* Charles J. Kavanagh. (13) Oct. 30.
New Mississippi River Bridge at Memphis.* (15) Oct. 31.
Building a Ponton Bridge in Swift Water. T. H. Dillon. (100) Nov.
Deflection of Unstiffened Suspension Bridges.* G. B. Pillsbury, Assoc. M. Am. Soc. C. E. (100) Nov.
Le Pont de Schwarzenberg de l'Exposition de Leipzig.* (84) Sept.
Interessante, neuartige Brückenbauten in Eisenbeton.* Friedlaender. (51) Serial beginning Sup. No. 19.
Die neue Brückenbauwerkstatt für die Quebec-Brücke.* Müllenhoff. (69) Sept.
Zur Theorie der Drucklinien-Gewölbe.* Apád Gut. (53) Sept. 25.
Zwei Eisenbahnbrücken aus Eisenbeton.* Robert Berman. (78) Serial beginning Oct. 2.

Electrical.

An Electrical Measuring Machine.* P. E. Shaw. (75) Mar.
On the Goldschmidt Alternator.* Thomas R. Lyle. (Paper read before the British Assoc.) (73) Sept. 26.
Further Research of the Electric Arc as a Standard of Light.* J. F. Forrest. (Paper read before the British Assoc.) (73) Sept. 26.
Central Station Co-Operation in the Electric Vehicle Industry. Douglas Sutherland Martin. (9) Oct.
The Use of the Synchronous Commutator in Alternating Current Measurements.* Frederick Bedell. (3) Oct.
Notes on Oil Circuit Breakers for Large Powers and High Potentials.* K. C. Randall. (42) Oct.
Tungsten Lamps of High Efficiency.* Irving Langmuir and J. A. Orange. (42) Oct.
Relation of Plant Size to Power Cost.* P. M. Lincoln. (42) Oct.
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The Cost of Municipal Electric Lighting at Chicago. Ray Palmer. (Abstract of paper read before the City Club of Chicago.) (13) Oct. 2.
Waterwheel Generators.* (96) Oct. 2.
Some Experiments on Contacts Between Bad Conductors. W. H. Eccles. (Paper read before the British Assoc.) (73) Oct. 3.
The Electric Truck: English Experiments and American Practice.* (26) Oct. 3.
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Power Generation and Transmission.* (17) Oct. 4.
Notes on the Present Status of Electric Furnaces. Wilfred Sykes. (Paper read before the Assoc. of Iron and Steel Elec. Engrs.) (62) Oct. 6; (20) Oct. 16.
Arc Lamps as Related to Shop Lighting.* Clarence E. Clewell. (72) Serial beginning Oct. 9.
Experiments on Corona Losses in Transmission Lines.* Weidig and Jaensch. (From *Elektrotechnische Zeitschrift.*) (73) Oct. 10.
Sine-Wave Transmission in the Submarine Telegraph Cable.* H. W. Malcolm. (73) Serial beginning Oct. 10.
Considerations in the Design of Head-Lamp Light Sources.* A. R. Dennington. (27) Oct. 11.
Measuring Currents in Underground Structures. Carl Hering. (17) Oct. 11.
Water Wheel Generators for the Newer Hydro-Electric Practice.* (62) Oct 13.
The Induction Motor.* F. A. Annett. (64) Serial beginning Oct. 14.
Report of the Committee on Power Generation. (Abstract of paper read before the Am. Elec. Ry. Eng. Assoc.) (17) Oct. 16.

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The Committee Park Bridge. St. Louis, Mo.* Concrete. 7p. Models. (13) Dec. 2.
Kansas-Oregon Drive Bridge, Ayer Wyoming.* (13) Dec. 2.
Lincoln Park Arcade Bridge.* (13) Dec. 2.
Bridges at the Commercial Conference. (13) Dec. 2.
The Broadway Bridge over Willamette River, Portland, Oregon. (Concrete.) (13) Dec. 2.
Bridges Spans 2 Wide. Illustrated. (13) Dec. 2.
Bridges and Culverts for Country Roads. A. N. Johnson. Steam road rollers for bridge work. (13) Dec. 2.
Arm. Road Conference. (13) Dec. 2.
Designing Concrete Piers for a Railroad Bridge. (13) Dec. 2.
Arrick Skids for Ugly Bridges.* (13) Dec. 2.
Three-Hinged Arch Bridges.* (13) Dec. 2.
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Foundations. C. C. Tervin. (13) Oct. 11.
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Inspection of Completed Structures. C. C. Tervin. (13) Oct. 11.
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Le Pont de Sedan-Torcy. (13) Oct. 11.
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Carbon and Impregnated Electrodes for Arc Lamps.* A. T. Baldwin. (27) Oct. 18.
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The Calculation of Stability in Non-Intact Conditions.* W. S. Abell. (90) Vol. 55, Pt. 1.
Recent Developments in Battleship Type.* Alan H. Burgoyne. (90) Vol. 55, Pt. 1.
The Influence of Air Pumps on the Military Efficiency of Turbine-Driven Warships.* D. B. Morison. (90) Vol. 55, Pt. 1.
Mechanical Gearing for the Propulsion of Ships.* Charles A. Parsons. (90) Vol. 55, Pt. 1.
Compressed Air for Working Auxiliaries in Ships Propelled by Internal Combustion Engines.* W. Reavell. (90) Vol. 55, Pt. 1.
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Stresses in Stayed Cylindrical Shells.* C. E. Stromeyer. (90) Vol. 55, Pt. 1.
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Notes on Modern Airship Construction.* A. Roenne. (90) Vol. 55, Pt. 1.

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The Longitudinal Stability of Skimmers and Hydro-Aeroplanes.* J. E. Steele. (90) Vol. 55, Pt. 1.
The Energy Systems Accompanying the Motion of Bodies Through Air and Water. J. B. Henderson. (90) Vol. 55, Pt. 1.
Belt Coal Conveyor at Middlesbrough.* (12) Sept. 26.
Diesel Engine Cylinder Dimensions.* (11) Sept. 26.
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Some Aspects of Heat Flow.* E. F. Northrup. (Paper read before the Am. Electrochemical Soc.) (105) Oct.
Flow of Heat Through Furnace Walls, the Shape Factor. Irving Langmuir, E. Q. Adams and G. S. Meikle. (Paper read before the Am. Electrochemical Soc.) (105) Oct.
Securing Efficient Results in the Manufacture of Boilers.* Delbert E. Merrifield. (94) Oct.
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Elevators: Their Uses and Abuses. B. C. Van Emon. (Paper read before the Technical Soc. of the Pacific Coast.) (1) Oct.
The Manufacture and Uses of Portland Cement. L. M. Bailey. (Paper read before the Utah Soc. of Engrs.) (1) Oct.
Electric Cable Drills in a Cement Quarry. F. L. Jorgensen. (67) Oct.
An Economical Plant for Sand and Gravel.* Robert M. Hale. (67) Oct.
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Low Temperature Carbonization in Vacuo, in its Relation to the Production of Smokeless Fuel, Oils, and Motor Spirit.* F. D. Marshall. (Paper read before the Manchester and District Junior Gas Assoc.) (66) Oct. 7.
The Underpinning of a Retort-Bench. F. L. MacLaren. (Paper read before the Scottish Junior Gas Assoc.) (66) Oct. 7.
Thermal Testing Plant at the Pennsylvania State College. J. A. Moyer. (Abstract of paper read before the Inter. Congress of Refrigeration.) (13) Oct. 9.
The Story of Some Difficult Steel Castings, the Foundry, Machining, Testing and Transportation Problems of a Shaft Cover for New York's Catskill Aqueduct.* E. C. Jensen. (20) Oct. 9.
Casting Parts of a 6 000-H. P. Gas Engine.* (20) Oct. 9.
A Practical Chart for Determining the Horsepower of Spur Gears.* Frederic W. James. (13) Oct. 9.
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Empirical Design of Gas Engines.* G. W. Lewis and A. G. Kessler. (72) Oct. 9.
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The Gas Industry in Its Relation to Smoke Abatement. Vivian B. Lewes. (Paper read before the Conference on Coal Smoke Abatement.) (66) Oct. 14.
Notes on Gas Manufacture, the Koppers Chamber Ovens at Birmingham.* W. H. Johns. (Paper read before the Midland Junior Gas Assoc.) (66) Oct. 14.
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Construction of the Midway Gas Line.* W. E. Barrett. (From the *Journal of Electricity.*) (83) Oct. 15.
California Oil Gas Developments.* L. B. Jones. (83) Oct. 15.
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Bucket Elevators. Reginald Trautschold. (96) Oct. 16.
The Electric Drive for Rolling Mills. Brent Wiley. (20) Oct. 16.
The Steam Friction of Turbine Wheels.* William Kerr. (Paper read before the Scientific Soc. of the Glasgow Royal Technical College.) (47) Serial beginning Oct. 17.
Southwestern Portland Cement Works.* Charles A. Smith. (16) Oct. 18.
Wet Bucket Elevator Design.* Arthur O. Gates. (16) Oct. 18.
Coal-Handling Plants for Panama. (From *Canal Record.*) (14) Oct. 18.
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Making of Gray Iron Motor Car Castings.* H. B. Swan. (Paper read before the Am. Foundrymen's Assoc.) (20) Oct. 23.
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Thornycroft Water-Tube Boiler for Oil Fuel.* (11) Oct. 24.
A Coal-Handling Plant at Crewe.* (57) Oct. 24.
By-Product Coking and Benjol Recovery.* G. S. Cooper and Franz Puning. (Papers read before the Junior Institution of Engrs.) (22) Oct. 24.
Fuel Possibilities in Steel Making. William Whigham. (Abstract of paper read before the Am. Iron and Steel Inst.) (62) Oct. 27.
Use and Development of Refractories in the Iron and Steel Industry. Harry W. Croft. (Abstract of paper read before the Am. Iron and Steel Inst.) (62) Oct. 27.
Progress in Gas Engineering. Walter R. Addicks. (Paper read before the Am. Gas Inst.) (24) Oct. 27; (83) Nov. 1.
Air in Condensers.* H. Fothergill. (64) Oct. 28.
Comparative Installation and Operating Costs of a Combined Ice-Manufacturing and Coal-Storage Plant. R. H. Tait and L. C. Nordmeyer. (Paper read before the Third Inter. Congress of Refrigeration.) (64) Oct. 28.
The Manufacture of Armor Plate.* D. K. Bullens. (20) Oct. 30.
A Modern Cement and Hydrated Lime Plant.* Richard K. Meade. (13) Oct. 30.
Progress in Steel Mill Roll Design.* Thomas H. Mathias. (Paper read before the Am. Iron and Steel Inst.) (20) Serial beginning Oct. 30.
A Forty-Foot Boring and Turning Mill.* E. A. Snverkrop. (24) Oct. 30.
Making Engines for Caterpillar Tractors.* F. A. Stanley. (24) Oct. 30.
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Neuzeitliche Kabelkrane und ihre Anwendung auf das Bauwesen. M. Buhle. (51) Serial beginning Oct. 1.

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Developments in Lining Blastfurnaces.* C. A. Tupper. (From the *Iron Trade Review.*) (47) Sept. 26.
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Mill Physiology. Stephen L. Goodale. (105) Oct.
Possible Applications of the Electric Furnace to Western Metallurgy. Dorsey A. Lyon and Robert M. Keeney. (Paper read before the Am. Electrochemical Soc.) (105) Oct.
The Art of Electric Zinc Smelting. Woolsey McA. Johnson. (Paper read before the Am. Electrochemical Soc.) (105) Oct.
The Electric Zinc Furnace. Peter E. Peterson. (Paper read before the Am. Electrochemical Soc.) (105) Oct.
The New Blast Furnace at Port Colborne, Ont.* (20) Oct. 2.
The Induction Furnace for Crucible Steel-Making. John Härdén. (22) Oct. 3; (105) Oct.
The Electric Furnace for Heat Treatment of Steel.* Robert Bain. (62) Oct. 6.
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The Use of Cement for Excluding Water from Oil Sands in Drilling Wells. Paul M. Paine, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
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Machine Mining in the South Wales Steam Coals. G. D. Budge and W. E. Jayne. (Paper read before the South Wales Inst. of Engrs.) (57) Sept. 26.
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The Nitrate Fields of Chile.* Walter S. Tower. (From the *Popular Science Monthly.*) (103) Sept. 27.
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Gasoline Motors in Coal Mines.* A. J. King. (Paper read before the West Virginia Coal Min. Inst.) (45) Oct.
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Winding Appliances, Winding Ropes and Capels: Past and Present.* A. S. Bratley. (Paper read before the National Assoc. of Colliery Mgrs.) (22) Oct. 24.
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Bibliography on Valuation of Public Utilities. The Library Force, Am. Soc. C. E. (54) Vol. 76.
Some Tendencies and Problems of the Present Day and the Relation of the Engineer Thereto. George Fillmore Swain, President, Am. Soc. C. E. (54) Vol. 76.
The Status of the Lighting Art. Preston S. Millar. (Paper read before the Illuminating Eng. Soc.) (24) Oct. 13.
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A Suggested Improvement in Building Water-Bound Macadam Roads. J. L. Meem, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
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Municipal Progress in Tiverton.* J. Siddalls. (104) Oct. 3.
Selection of Materials for Macadam Roads. Logan Waller Page. (Abstract of paper read before the Am. Road Congress.) (14) Oct. 4.
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Highway Accounting with Special Reference to Maintenance. Halbert P. Gillette. (Paper read before the Am. Road Congress.) (86) Oct. 8.
The Concrete Roads of Wayne County, Mich. Frank F. Rogers. (Paper read before the Am. Road Congress.) (13) Oct. 9.
Treatment of Worn Out and Raveled Macadam Road Surfaces. E. A. Stevens. (Paper read before the Am. Road Congress.) (13) Oct. 9; (96) Oct. 9.
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California's $18 000 000 State Highway System. Austin B. Fletcher. (Abstract of paper read before the Am. Road Congress.) (14) Oct. 14.
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Essential Features in Good Brick Road Construction. Jas. M. McCleary. (Paper read before the Am. Highway Assoc.) (96) Oct. 16.

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Rules Governing the Use of Heavy Vehicles on Highways. (New York Highway Comm.) (14) Oct. 25.
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Observations on European Paving Methods and Materials. E. H. Thomes. (Abstract of Report made to the City of New York.) (86) Oct. 29.
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The Elevation of the Tracks of the Philadelphia, Germantown and Norristown Railroad, Philadelphia, Pa.* Samuel Tobias Wagner, M. Am. Soc. C. E. (54) Vol 76.
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Location of Steam Gages in Setting Safety Valves. C. T. Rommel. (25) Oct.
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Report of the Committee on Express and Freight Traffic. (Abstract of paper read before the Am. Elec. Ry. Transportation and Traffic Assoc.) (17) Oct. 16.
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The Present Tendency of Public Service Regulation. Richard M'Culloch. (Abstract of paper read before the Am. Elec. Ry. Assoc.) (17) Oct. 17.
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Record of a Lehigh Valley Locomotive.* (15) Oct. 17.
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Proposed Development of Chicago Railway Facilities. John F. Wallace. (Report to the City Council.) (15) Oct. 24; (14) Nov. 1.
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Characteristics and Operating Features of the Gas-Electric Car. L. C. Josephs, Jr. (Abstract of paper read before the Assoc. of Ry. Elec. Engrs.) (15) Oct. 31.
Wreck Caused by a Broken Tire, Cleveland, Cincinnati, Chicago & St. Louis.* (15) Oct. 31.
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A Brief Description of a Modern Street Railway Track Construction.* A. C. Polk, Assoc. M. Am. Soc. C. E. (54) Vol. 76.
Old and New Carhouses at Berlin, Germany.* (17) Oct. 4.
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Kenmore Shops of the Northern Ohio Traction & Light Company.* Jay C. Lathrop. (17) Oct. 18.
The Harlem River Tubular Steel Tunnel, New York City.* (18) Oct. 18.
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